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ABSTRACT

A user study to determine the ratio of citation-bound queries to data-bound queries originated by university faculty and processed through reference department personnel or by independent use of reference materials in the university library revealed a majority (75%) of the queries are citation-bound. Important implications are suggested for the training of university reference librarians and the selection and development of reference tools. The skillful use of the newer tools of citation indexes, journal indexes, and other sources of bibliographic information is necessary for the provision of citation-bound services. (MF)

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Faculty Use of University Library Reference Facilities for Citation and Data Information

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FACULTY USE OF UNIVERSITY LIBRARY REFERENCE FACILITIES FOR CITATION AND DATA INFORMATION

SUMMARY

A user study was undertaken to determine the ratio of citation-bound queries to data-bound queries originated by university faculty and processed through reference department personnel or by independent use of reference materials in the university library. A citation-bound query was one which referred to a document previously known to the user but for which he required accurate bibliographical information in order to identify it uniquely. A document was defined as "known" if it had been seen on some prior occasion, or had been heard about. A data-bound query referred to a query for which the expected answer was a piece of factual information unrelated to a particular document. The problem was stated as a null hypothesis: The university faculty member is as likely to use the reference facilities of the university library for information on specific citations as he is for factual information.

A questionnaire designed around the critical incident of the most recent contact with the reference department was addressed to a 10% + proportional stratified random sample obtained from faculty payroll data and followed up by telephone and personal visits. The null hypothesis was tested for significance at the .05 level and rejected. The problem was further refined by the statement of a second hypothesis: A significant majority of the queries addressed by faculty to the reference services are citation-bound queries rather than data-bound queries. The verification of this second hypothesis lends support to the rationale for providing some forms of computerized reference service in the university library for which the data base can be obtained from bibliographical notation.

BACKGROUND FOR THE STUDY

Numerous studies have been made of reference questions submitted to reference personnel, and tallies have been kept on the amount of time devoted to their processing.[1] Other uses of reference material by patrons who do not ask for assistance cannot reliably be obtained from the type of statistics maintained by reference librarians. Estimating type of use by some such measure as material taken from shelves and left on tables is extremely difficult. Indicative of the general trend of statistical studies was one which classified 1350 inqueries recorded at the Cleveland Medical Library. The inqueries were

divided into

> direct inqueries, "in which the answer is supplied in the form of...data, facts, formulae, definitions, etc."; indirect inqueries, "in which the answer is supplied in the form of one or more references to the literature"; biography and directory inqueries; and verification inqueries, which supply a completed or verified reference to a specific document that is already known to exist. This is actually a classification of the answers supplied rather than of the inqueries.... About half of the recorded inqueries were classified as "indirect," another quarter as "verification inqueries," one-eighth as "direct," and the remainder as "biography and directory inqueries."[2]

As indicated, the above study of a special library in a scientific field approached the problem from the standpoint of analysis of answers to queries. Nevertheless, the analysis does suggest that a large majority (75%) of the queries are citation-bound, i.e., one-half were "indirect" references to the literature, and one-quarter supplied a completed or verified reference. In library literature discussion of the proportions of citation-bound requests, as distinguished from data-bound requests, is usually stated as educated opinion, but verification by means of properly designed research has been absent.[3] In related research on the general problem of exactly what the user wants from the library, preliminary results of a study undertaken at Yale University Library indicate that over 80% of the users of the library catalog bring with them notes and clues and conduct searches for documents already known by them to exist.[4]

The following schematic diagram of information flow in the reference department illustrates the focus of the research reported in this paper:

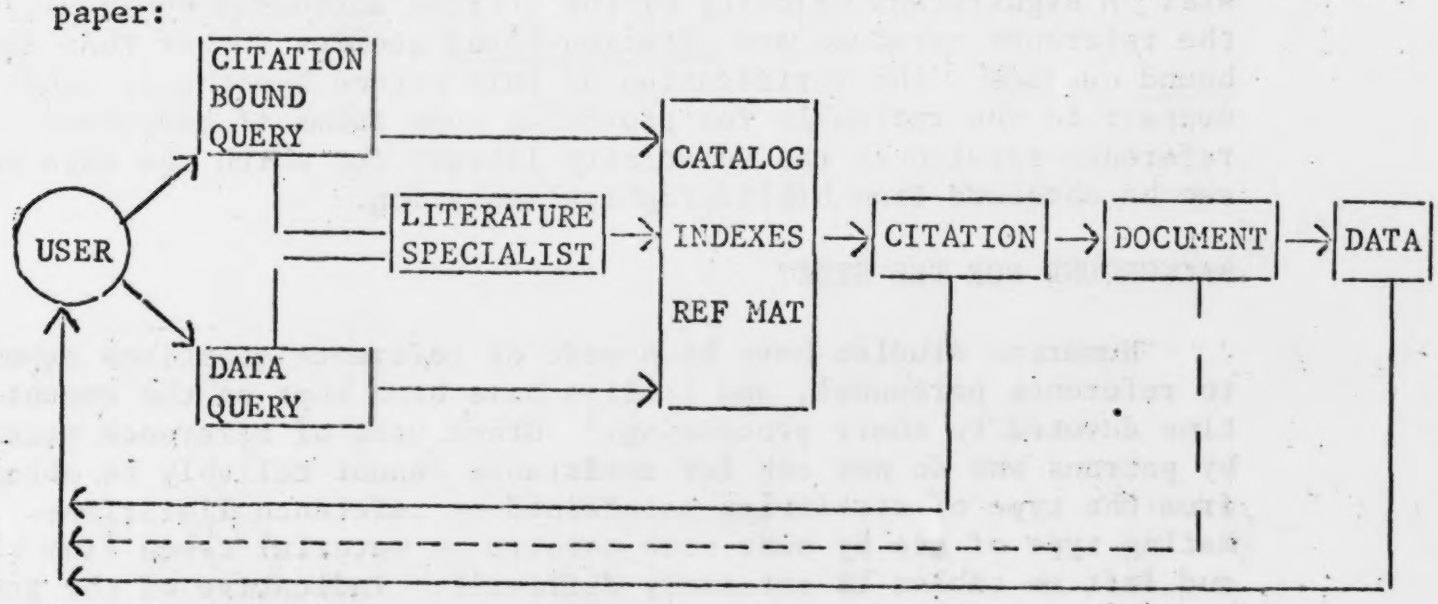

Fig. 1. Schematic diagram showing the flow of information generated from two types of queries which may be input to a reference system.

According to the diagram, the user may or may not negotiate his query through the literature specialist (more commonly known as the reference librarian). The output can be a citation, the document to which the citation refers (represented by the dotted line), or data contained in the document and each of these can be cycled back to the user in response to his query.

It was assumed in this study that the user could obtain both types of service (output), i.e., both citations and data, from the reference personnel and/or collection and that in-person, surrogate, telephone, or letter requests were all equally honored. It was also assumed that the user's choice of fact (data) versus citation was not significantly influenced by his expectation of type and/or quality of service available. More correctly, it was assumed that these factors, while no doubt influential, would even themselves out in the sample selected. As noted above, reference statistics are not usually kept in a form which will easily distinguish the citation-bound output from a factual piece of information. To initiate this type of record keeping would necessarily tie the statistics to the periodicity of the normal school year and would have to be maintained for that length of time before any accurate analysis could be made. To overcome this tendency to periodicity, the user was asked to recall his most recent use of the library's reference facilities which, for some of them, might not have occurred for months. As is the case in any study using the critical incident technique, it was assumed that such recall would be possible.

The present study was limited to the use made of reference facilities by university faculty members. The undergraduate use of the library reference services should be the subject of a subsequent inquiry. At M.I.T. a survey conducted in 1959 indicated that 56.4% of the faculty members who visited the M.I.T. libraries in the week that the survey was taken were there for research purposes (which presumably included the use of reference materials) whereas the student use for this purpose was only 14.9%. The percentages for graduate students were 37.2% and 74.6%. In terms of gross numbers, three times as many faculty members and graduate students used the libraries for research purposes as did undergraduates.[5] A number of investigations have demonstrated similarities between faculty and graduate use of the library in other areas of interest and with other emphases, but follow-up for purposes of verification is needed.[6]

METHODS

Faculty was chosen as a first subject for this study on the basis of the availability of records from payroll data. A listing of Temple University faculty members was available to the investigator as a by-product from the production of identification badges for faculty use. Although the professional schools were originally proposed for inclusion preliminary sampling indicated that a large number had never used the general library. It was concluded that a separate study for these schools would be more appropriate. The final list was sorted by department and printed out within each department in alphabetical order.

From each of these lists a 10%+ proportional stratified sample was selected using a table of random numbers.[7]

A questionnaire designed around a critical incident--the most recent contact with the reference department--was sent via inter-office mail to each of the selected faculty members and followed up at intervals to insure completeness of returns. This involved telephone calls and personal visits although the questionnaire was brief enough to be answered in a few minutes (see Appendix). The tabulation of results was tested for significance at the .05 level.[8] All operations involving statistical methods both in choosing the sample and analyzing the data were submitted to a qualified statistician for verification.

FINDINGS AND ANALYSIS

Questionnaires were sent to 158 faculty members. Of these, 13 either failed to reply or ambiguities in the replies could not be resolved. Of the remaining 145 replies received, 110 were classed as citation-bound and 35 were classed as data-bound. The statistical argument is as follows:

1. Let P_1 be the probability that the user made a citation-bound query.
   Let P_2 be the probability that the user made a data-bound query.
   Then the null hypothesis may be stated as
   $$H_0 : P_1 = P_2 = \tfrac{1}{2}$$
   The alternative hypothesis H_1 may be stated
   $$H_1 : P_1 > P_2$$

2. The statistical test used to test the null hypothesis is the binomial test.

3. The level of significance chosen was .05 on a sample size of 145.

4. Since $P_1 = P_2 = \tfrac{1}{2}$, and the sample size was sufficiently large, the normal approximation to the binomial distribution with a correction for continuity was used to evaluate the statistic:

$$Z = \frac{(x-.5) - NP}{\sqrt{NPQ}}$$

where x is the observed number of citation-bound queries, N is equal to the sample size 145 and $P = Q = \tfrac{1}{2}$.

The null hypothesis was to be rejected if the one-tailed probability under H_0 of Z was greater than .05.

$$Z = \frac{(X-.05) - NP}{\sqrt{NPQ}} = \frac{37}{6.02079} = 6.145$$

The one tailed probability associated with a value of Z = 6.15 is effectively zero and the null hypothesis is easily rejected, and the second hypothesis can be accepted.

A demurrer might be noted at this point. The results of the survey may be slightly skewed in favor of studying the reference behavior of more experienced faculty. The vagaries of payroll listing and the time of the year at which it was obtained meant that no new faculty with less than six months experience could have been included. It is possible that experienced faculty might be more citation oriented than new faculty if new is equated with inexperienced. However, it is by no means certain that faculty new to Temple's campus would be inexperienced in their fields or in the use of libraries.

CONCLUSIONS

The rejection of the null hypothesis and the acceptance of the second hypothesis indicate that a significant proportion of the queries addressed to the university library facilities by faculty members are citation-bound. If this general finding is supported to some degree by investigation of undergraduate use of these services, important implications are suggested for the training of university reference librarians and the selection and development of reference tools.

The usefulness of the traditional tools for the reference librarian has been questioned, although in library school courses they continue to be strongly emphasized.[9] The skillful use of the newer tools of citation indexes, journal indexes, and other sources of bibliographical information is necessary for the provision of citation-bound services. There is supporting evidence in the literature that, for certain classes of users, the most important reference services are citation oriented.[10] There is also a large body of research which develops the thesis that for scientific users, which would include many of the university faculty, most information is obtained from personal reading or oral communication, i.e., for most of the information they need or want they have prior knowledge of bibliographic citation.[11]

The present study was directed toward the analysis of the reference use behavior of a general body of users as differentiated from those who are engaged in specific scientific activities. The evidence suggests that a citation bias on the part of general users does exist and further supports the theoretical basis on which citation oriented services such as M. M. Kessler's computer based M.I.T. Technical Information Project and others are built.[12] Provision of a computerized reference service in the university library, for which the data base is obtained from bibliographical elements, can be a much closer reality than the development of a general use thesaurus for subject searching by a multi-interest clientele. For these reasons, efficient reference services would function to a large degree as supportive rather than primary sources of information.

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APPENDIX

PALEY LIBRARY REFERENCE USE SURVEY

Your assistance in helping to plan better library service for Temple University is requested. Please complete the questionnaire by checking and filling in all pertinent answers under each section.

Name (optional) Academic department

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1. The purpose of your most recent personal visit, or telephone call, or message to the reference department of the university library was

   A._____to check a bibliographical fact, or facts

   _____title unknown
   _____author unknown
   _____journal
   _____other (e.g., date, page, edition)_____
   _____facts known but I wished to verify their accuracy.

   B._____to find the answer to a specific question
   Question:_____

   C._____Other_____

2. If your purpose was to check a bibliographical fact, indicate where you saw or heard of the original reference:

   _____in book or journal

   _____information from colleague

   _____own file or index

   _____other_____

3. If the occasion of your most recent contact with the reference department was a personal visit, did you

   _____ask the reference personnel for assistance? and/or

   _____use any of the materials without assistance?
   Type of material_____